

STS-105 Flight Readiness Review (FRR) Minutes

The STS-105 FRR convened at 10:30 a.m. on Wednesday, August 1, 2001, in the Mission Briefing Room, at the Kennedy Space Center (KSC). The meeting was chaired by R. Estess, Space Shuttle Program Lead Center Acting Director.

Flight Crew, Ferry Readiness, Range, and DDMS did not have any issues or constraints to flight and did not make formal presentations. Readiness statements submitted were included in the backup package.

The STS-105 FRR presenters were:

Mission Operations – W. Hale (NASA/JSC/DA8),
M. Ferring (NASA/JSC/DA8),
T. Sobchak (NASA/GSFC/451),
L. Bourgeois (USA/Houston/ USH-402C)
EVA – M. Tullar (Hamilton Sundstrand/JSC/XA-HAM),
G. Lutz (NASA/JSC/XA)
Program Integration – V. Ellerbe (NASA/JSC/MA2)
Payload Processing – G. Chin (NASA/KSC/UB-1)
International Space Station –
S. Castle (NASA/JSC/OC),
W. Spetch (NASA/JSC/OM),
S. Walker (NASA/JSC/OB),
J. Lewis (NASA/JSC/OB),
S. Reagan (NASA/MSFC/FD23)
P. Thomas (Boeing/Houston/JHOU-2340),
R. Lofton (NASA/JSC/OZ2),
B. Key (NASA/MSFC/FD31)
External Tank – J. Smelser (NASA/MSFC/MP31)
RSRM – T. Boardman (Thiokol/Utah/L00)
SRB - R. Elliott (USA/KSC/USK-417)
SSME - D. Adamski (Rocketdyne/Canoga Park/55-AB88)
Vehicle Engineering - D. White (USA/Houston/USH-601M)
Shuttle Processing - J. Vevera (USA/KSC/USK-229)
R. Millang (USA/KSC/USK-459)
M. Leinbach (NASA/KSC/PH)
Space and Life Sciences – S. Pool (NASA/JSC/SA)
SR&QA - M. Erminger (NASA/JSC/MQ)

Mission Operations

Mission 7A.1 in the International Space Station (ISS) assembly sequence will rotate Expedition 2/3 crews, fly the Multi-Purpose Logistics Module (MPLM) for critical cargo transfer, and install the Early Ammonia Servicer, Express racks 4/5, and Materials ISS Experiment. The mission will also perform two extra-vehicular activities to install the S0 cables and conduct Dreamtime activities. After undocking, the SIMPLESAT will be deployed.

Mission requirements, integrated network activity, facility readiness, flight rule changes, and ascent performance were presented. ISS emergency procedures are being updated to reflect the expected arrival of the Russian docking compartment. Crew training will now emphasize procedures for toxic spills as a result of the recent battery electrolyte leakage.

Extravehicular Activity (EVA)

A special topic was discussed regarding the Increased Capacity Battery electrolyte leakage on STS-104. Resolution consisted of storing the batteries for launch in the upright position, modifying the fill/formation process procedures, and correcting the wicking configuration. A second special topic concerned corrosion in the top mounted handrail brackets, which will not be used by EVA crews pending completion of fracture analysis.

Program Integration

Mission requirements call for a 12-day mission with two extra-vehicular activities (EVA's) from the orbiter airlock. Critical crew rotation hardware is stowed in the middeck rather than the MPLM.

Payload Processing

Open work and launch delay payload requirements were reviewed.

International Space Station (ISS)

Special topics included the MPLM intermodule ventilation valve leak test failures due to insufficient seal compression and possible contamination, Node 1 fire responses during campout airlock emergency response, hazard analysis of the MPLM portable fire extinguisher, and surface corrosion on the Flight Module-1 passive common berthing mechanism.

Avionics and Software reviewed progress on deploying mass storage replacement units to mitigate problems experienced on Mission 6A, the Russian software upgrade for the docking compartment, and the control moment gyroscope #2 outer gimbal bias error. Unusable payload Ethernet interfaces and locked-up rack interface controllers on the express racks will be resolved by uploading software modifications, which are not a constraint to launch. The Early Ammonia Servicer grapple fixture load exceedance problem has been resolved. The associated exception is in closure.

External Tank (ET)

There was one approved waiver presented: the liquid oxygen tank thermal protection system does not meet the launch probability "no-ice" requirement. ET-110 is the last External Tank with this waiver.

Reusable Solid Rocket Motor (RSRM)

No significant discrepancies were detected during the STS-104 motor disassembly.

Solid Rocket Booster (SRB)

Class I change since STS-104 is first flight of the new design, single mission fuel isolation valve, which eliminates corrosion problems and precludes inadvertent introduction of hydrazine into the hydraulic power unit gas generator.

Space Shuttle Main Engine (SSME)

Major components, ignition margins, predicted performance, and redline margins were presented. One special topic discussed high pressure fuel turbo pump tip seal fretting, which is a reoccurrence of a previously accepted condition. Repaired or replaced tip seals are inspected prior to each flight. A walk-on special topic highlighted oxidizer preburner igniter harness damage (localized overheating) noted during STS-105 aft compartment closeout inspections. The damaged harness will be replaced and electrical/igniter checks repeated to confirm proper function.

Vehicle Engineering

All STS-102 and STS-104 anomalies have been reviewed and none constrain the STS-105 flight. The STS-104 flood light cold plate temperature transient was traced to missing insulation on OV-104. The insulation on OV-103 is properly configured. The flash evaporator system water feed line "A" heater string #1 failed. The system is acceptable for STS-105 flight since procedures exist to prevent freezing and recover the line for entry if both heaters fail. Although the OV-104 Ku-Band failed to acquire forward link communication on STS-104, all testing has been successfully completed on OV-103 and there is no evidence to suggest a generic or fleet problem. Likewise, an anomaly with the OV-104 left vent doors #8 and #9 limit switch does not apply to OV-103 with the successful completion of all vent door testing. Due to recent failures in both advanced and enhanced master event controllers (AMEC/EMEC), two standard master event controllers (MEC) have been installed in OV-103.

Shuttle Processing

Payload late access platform fit checks and orbiter frequency response testing were considered planned processing differences while the multiplexer/demultiplexer operational instrumentation-aft replacement/retest, main engine pressure transducer replacement, control room #1 to #3 swap, master event controller replacement/retest, and the liquid oxygen preburner cable change-out were listed as unplanned work. An intermittent signal path in the pulse code modulation master unit (PCMMU) #1 was the basis for a deferred unexplained anomaly and recommendation to launch using PCMMU #2. The signal distortion in PCMMU #1 affects ground processing only and has no effect on flight.

Space and Life Sciences

Status was given on crew health, detailed supplementary objectives, radiation analysis and dosimetry support.

Safety, Reliability and Quality Assurance

Significant Assessments have been performed on the early ammonia servicer issues, AMEC failure, STS-104 battery electrolyte leakage, and STS-104 Zaragoza single string TACAN capability. Independent assessments were performed on EEPROM deficiencies affecting electrical power system orbital replacement units, adequacy of the ISS caution and warning configuration to support crew sleep, adequacy of the trash stowage plan to support an occupied ISS, and ISS increment pre-mission and mission timeline development processes.

Exceptions/Action Items

Two Certificate of Flight Readiness Exceptions listed the continued assessment of the SSME igniter harness damage and the resolution of potential negative margins on bay 1 fluid line brackets. Both exceptions will be updated at the Prelaunch Mission Management Team meeting.

Mr. Estess polled the principal managers and organizations; all responded ready to support the STS-105 mission.

A handwritten signature in black ink, appearing to read "J. Halsell Jr.", written in a cursive style.

James D. Halsell, Jr.
Colonel, USAF
Manager, Launch Integration

Enclosures:

Agenda

Exception Log

STS-105
Flight Readiness Review
August 1, 2001

Agenda

Introduction	Manager, Launch Integration
Mission Operations	Director, Mission Operations Flight Director, Mission Operations APM, Flight Operations, SFOC
EVA	Manager, EVA Project
Program Integration	Flight Manager Manager, Space Shuttle KSC Integration Manager, Space Shuttle Systems Integration Manager, Space Shuttle Customer and Flight Integration APM, Program Integration, SFOC
Payload Processing	Director of ISS/Payloads Processing
International Space Station	Manager, International Space Station Program
External Tank	Manager, External Tank Project
RSRM	Manager, Reusable Solid Rocket Motor Project
SRB	Manager, Solid Rocket Booster Project APM, SRB Element, SFOC
SSME	Manager, Space Shuttle Main Engine Project
Vehicle Engineering	Manager, Space Shuttle Vehicle Engineering APM, Orbiter Element, SFOC APM, Flight Software, SFOC APM, FCE/EVA, SFOC
Shuttle Processing	Director of Shuttle Processing APM, Ground Operations, SFOC APM, Integrated Logistics, SFOC
Flight Crew	Director, Flight Crew Operations
Space and Life Sciences	Director, Space and Life Sciences
Ferry Readiness	Ferry Operations Manager
Range	United States Air Force
DDMS	Director, DDMS
SR&QA	Manager, Safety, Reliability and Quality Assurance
Exception/Action Summaries	Manager, Launch Integration
Readiness Poll	Lead Center Director for Space Shuttle and Space Station Programs

CoFR EXCEPTION LOG				CoFR REVIEW DATE: 08-01-01 STS FLT NO. STS-105
REQUIREMENT/ EXCEPTION NUMBER	ELEMENT	DESCRIPTION OF EXCEPTION	DUE DATE	
001	SSME	CoFR REQUIREMENT: 8.5.e.8 - OPEN WORK /AND OR ACTIONS ARE PLANNED AND SCHEDULED. ADDITIONAL ANALYSIS REQUIRED DUE TO CLOSE PR ME2044-0121: E2044 OPB IGNITER HARNESS DAMAGE.	STS-105 PMMT	
002	ORBITER	CoFR REQUIREMENT: 8.5.1.1.d - NECESSARY SAFETY ANALYSIS MATERIALS TESTS, AND CERTIFICATION AND FLIGHT READINESS REQUIREMENTS ARE COMPLETED. POTENTIAL NEGATIVE MARGIN ON BAY ONE FLUID LINE BRACKETS NEEDS TO BE RESOLVED.	STS-105 PMMT	